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10/537,528

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Saito Shinichiro

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STETINA BRUNDA GARRED & BRUCKER
75 ENTERPRISE, SUITE 250
ALISO VIEJO, CA 92656

EXAMINER

MCKENZIE, THOMAS B

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/537,528	Applicant(s) SHINICHIRO ET AL.	
	Examiner THOMAS BENNETT MCKENZIE	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☒ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>12/27/2005</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: in paragraph 12, line 2, "use" is misspelled and should read "used".
2. Appropriate correction is required

Claim Objections

3. **Claim 12** is objected to because of the following informalities: "course" on the last line of page 3 is misspelled and should read "coarse". Appropriate correction is required.

Response to Arguments

4. Applicant's arguments submitted on 12/16/2009 have been fully considered.
5. With respect to **claim 1**, applicant's arguments are not persuasive. Although the apparatus of Hegemann in view of Heijwegen and in further view of Dahlstrom (the above combination) differs in function from the applicant's apparatus, the above combination teaches all of the structural elements as claimed in **claim 1** (as evidenced by the following rejection). MPEP 2114 states "while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function". Therefore the rejection of **claims 1-6** based on the above combination is maintained.
6. With respect to **claim 7**, the applicants arguments have been considered and were found persuasive. The rejection of **claims 7-11** based on the above combination

Art Unit: 1797

has been withdrawn. However, a new rejection has been inserted (see following rejection).

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. **Claims 1 and 4-7** are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over **claim 1** of copending **Application No. 11/663,673**. Although the conflicting claims are not identical, they are not patentably distinct from each other because **claim 1** of **11/663,673** substantially teaches all of the limitations of **claim 1** of **Application No. 10/537,528** as evidenced by the following table:

Application No. 10/537,528 (Current Application)	Application No. 11/663,673

<p>1. A cement kiln chlorine/sulfur bypass system for use with a cement kiln which produces a kiln exhaust including exhaust gas and exhaust dust, the system comprising:</p> <p>an air bleed means for bleeding a kiln exhaust gas passage, which runs from an end of a cement kiln to a bottom cyclone, the air bleed means receiving the exhaust;</p> <p>a separating means for separating dust in the gas bled by the air bleed means into coarse particles and fine particles; and</p> <p>a wet dust collector receiving the fine particles and exhaust gas from the separating means, the wet dust collector being configured to separate the fine particles from the gas.</p>	<p>1. A system for treating gas extracted from cement kiln comprising:</p> <p>a probe for extracting a part of combustion gas, while cooling it, from a kiln exhaust gas passage, which runs from an inlet end of a cement kiln to a bottom cyclone;</p> <p>a classifier for separating coarse powder from dust contained in the combustion gas extracted by said probe;</p> <p>a wet dust collector for collecting dust of the extracted gas containing fine powder discharged from said classifier.</p>
<p>4. The cement kiln chlorine/sulfur bypass system as claimed in claim 1, wherein said</p>	<p>2. The system for treating gas extracted from cement kiln as claimed in claim 1</p>

wet dust collector is a mixing scrubber.	wherein said wet dust collector comprising: a wet scrubber.
5. The cement kiln chlorine/sulfur bypass system as claimed in claim 4, wherein said mixing scrubber comprises a circulating liquid tank to which a dust slurry collected by the mixing scrubber is supplied and a circulating system by which a part of the dust slurry in the circulating liquid tank is returned to the mixing scrubber.	2. The system for treating gas extracted from cement kiln as claimed in claim 1 wherein said wet dust collector comprising: a wet scrubber; a circulation liquid tank to which slurry containing dust, which is collected by said wet scrubber, is fed.
6. The cement kiln chlorine/sulfur bypass system as claimed in claim 5, further comprising a sulfuric acid supplier for supplying sulfuric acid to the circulating liquid tank.	2. The system for treating gas extracted from cement kiln as claimed in claim 1 wherein said wet dust collector comprising: wherein said sulfurizing agent is added to one of the circulation liquid tank and the pump.
7. A method of treating a combustion gas exhausted from a cement kiln, the combustion gas including a dust, the	4. A method for treating dust contained in extracted cement kiln combustion gas comprising the steps of:

method comprising: bleeding a kiln exhaust gas passage, which runs from an end of a cement kiln to a bottom cyclone, of a part of the combustion gas; separating coarse particles in dust in the bled gas; and collecting dust from the gas containing fine particles by a wet dust collector with a solvent.	extracting a part of combustion gas, while cooling it, from a kiln exhaust gas passage, which runs from an inlet end of a cement kiln to a bottom cyclone; separating coarse powder from dust contained in said part of extracted combustion gas; and adding one of soda hydrosulfide and sodium sulfide to extracted combustion gas containing fine powder after coarse powder being separated when collecting dust of said extracted gas in wet process while desulfurizing the gas.
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9. **Claims 2 and 3** are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 11/663,673 in view of Schwamborn et al, USP 5,958,094 (Schwamborn).

10. Regarding **claim 2**, 11/663,673 teaches a classifier is used as the separating means. However, 11/663,673 does not teach that said classifier has variable cut size.

11. In an analogous art of classifying particles, Schwamborn substantially teaches a classifier with a variable cut-size (column 4, lines 15-35). It would have been obvious to

Art Unit: 1797

one of ordinary skill in the art at the time of the invention to use the classifier of Schwamborn with the apparatus of 11/663,673 for the benefit of improving classifying efficiency (column 2, lines 1-5).

12. Regarding **claim 3**, 11/663,673 does not teach the separating means includes a cyclone.

13. In an analogous art of classifying particles, Schwamborn substantially teaches a cyclone in which inlet gas velocity is changeable (column 4, lines 15-35). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the classifier of Schwamborn with the apparatus of 11/663,673 for the benefit of improving classifying efficiency (column 2, lines 1-5).

This is a provisional obviousness-type double patenting rejection.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

Art Unit: 1797

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
16. **Claims 1-5** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hegemann, USP 4,052,042 (Hegemann) in view of Heijwegen et al, USP 4,854,946 (Heijwegen).
17. Regarding **claim 1**, Hegemann substantially teaches a system which produces an exhaust including exhaust gas and exhaust dust, the system comprising: an air bleed means (figure 1, part 2; column 5, lines 25-30) for bleeding an exhaust gas passage, which runs from an end of a kiln to a bottom cyclone (figure 1, part 4; column 5, lines 39-45), the air bleed means receiving the exhaust (column 5, lines 25-30); and a separating means for separating dust in the gas bled by the air bleed means into coarse particles and fine particles (figure 1, part 4; column 5, lines 39-45).
18. Note that Hegemann does not explicitly teach a wet dust collector receiving the fine particles and exhaust gas from the separating means with the wet dust collector being configured to separate the fine particles from the gas. However, Hegemann does concern blast furnace exhaust gas purification.
19. In an analogous art of blast furnace exhaust gas purification, Heijwegen substantially teaches a wet dust collector receiving the fine particles and exhaust gas from the separating means (Heijwegen column 2, lines 20-21 and column 2, lines 50-55), the wet dust collector being configured to separate the fine particles from the gas (column 2, lines 10-15). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the separators described in Heijwegen with the

Art Unit: 1797

apparatus of Hegemann for the benefit of improving the separation selection of the separators (column 2, lines 20-30).

Regarding **claim 3**, the above combination substantially teaches the limitations of **claim 1** as described above. Note that the above combination does not explicitly teach the inlet gas velocity leading into the cyclone is changeable. However, Hegemann does teach a detector for a pressure valve (column 5, lines 35-36). Gas pressure and velocity are related. When the detector for a pressure valve measures a change in pressure, it also detects a change in gas velocity, implying that gas velocity is changeable.

20. Regarding **claim 4**, Heijwegen substantially teaches the wet dust collector is a mixing scrubber (column 3, lines 15-16).

21. Regarding **claim 5**, Heijwegen substantially teaches the mixing scrubber comprises a circulating liquid tank ("hydrocyclone", column 3, lines 20-25) to which a dust slurry collected by the mixing scrubber is supplied and a circulating system by which a part of the dust slurry in the circulating liquid tank is returned to the mixing scrubber (column 6, lines 35-40).

22. **Claim 2** is rejected under 35 U.S.C. 103(a) as being unpatentable over Hegemann in view of Heijwegen (the above combination) and in further view of USP 2,760,635 (Dahlstrom).

23. Regarding **claim 2**, the above combination substantially teaches the limitations of **claim 1**, as described above. Note that the above combination does not explicitly teach

Art Unit: 1797

the separating means includes a classifier in which cut size is changeable. However, the apparatus of Heijwegen uses a hydrocyclone (column 2, line 21).

24. In an analogous art of hydrocyclones, Dahlstrom substantially teaches a hydrocyclone that has an adjustable cut size (column 6, lines 55-60). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the hydrocyclone described in Dahlstrom with the above combination for the benefit of improving efficiency (column 4, lines 19-21).

25. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over the above combination in further view of Pazdej, USP 4,322,777 (Pazdej).

26. Regarding **claim 6**, the above combination substantially teaches the limitations of **claim 5**, as described above. Note that the above combination does not explicitly teach a sulfuric acid supplier. However, the above combination does teach cleaning blast furnace exhaust dust.

27. In an analogous art of cleaning blast furnace exhaust dust, Pazdej teaches treating exhaust dust with sulfuric acid in order to remove and obtain metals contained in the dust (column 1, lines 25-35). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add a sulfuric acid supplier to the apparatus of the above combination for the benefit of obtaining metals contained in the dust.

28. **Claims 7-11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Heilmann USP 3,638,400 (Heilmann) in view of McCord, USP 4,031,184 (McCord) and in further view of Schwamborn et al, USP 5,958,094 (Schwamborn).

Art Unit: 1797

29. Regarding **claim 7**, Heilmann substantially teaches a method of treating a combustion gas exhausted from a cement kiln (column 1, lines 50-60), the combustion gas including a dust (column 1, lines 50-60), the method comprising:

30. bleeding a kiln exhaust gas passage ("directing", column 1, lines 50-55), which runs from an end of a cement kiln to a bottom cyclone (figure 1, part 24; column 3, lines 45-55); of a part of a combustion gas (column 2, lines 45-55); and

31. separating coarse particles in dust in the bled gas (column 1, lines 65-70 and column 3, lines 1-5).

32. Note that Heilmann does not explicitly teach collecting dust from the gas containing fine particles by a wet dust collector with a solvent. However, Heilmann does teach that the fine dust particles are removed from the system (column 3, lines 1-7).

33. In an analogous art of cement kiln dust refinement, McCord teaches collecting dust in a wet dust collector with solvent (column 1, lines 55-60) for the benefit of making it suitable for reentry into the cement kiln (column 1, lines 45-55). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the process of Heilmann with the process of McCord for the benefit of reducing waste by recycling the fine particles back to the cement kiln.

34. Regarding **claim 8**, McCord substantially teaches at least a part of said dust slurry collected by the wet dust collector is added to a cement mill system (McCord column 2, lines 20-25).

Art Unit: 1797

35. Regarding **claim 9**, McCord substantially teaches the dust slurry collected by the wet dust collector is separated into solid, and liquid (McCord column 20-25) and a desalted dust cake is added to a cement mill system (McCord column 2, lines 20-27).

36. Regarding **claim 10**, McCord substantially teaches the dust slurry collected by the wet dust collector is separated into solid and liquid (McCord column 20-25), and at least a part of separated brine is added to a cement mill system (column 2, lines 50-57).

37. Regarding **claim 11**, McCord substantially teaches said dust slurry collected by the wet dust collector is separated into solid and liquid (McCord column 20-25); separated brine is desalted in salt recovery process to recover industry salt (column 2, lines 45-50); and treated aqueous solution after desalting is utilized again as washing aqueous solution for washing after the solid/liquid separation or/and aqueous solution for collection at the wet dust collector (column 2, lines 50-55).

38. Note that McCord does not explicitly teach water. However, McCord does teach aqueous solution (column 1, lines 55-60). The examiner concludes that aqueous solution reads on water.

39. **Claim 12** is rejected under 35 U.S.C. 103(a) as being unpatentable over Heilmann in view of McCord and in further view of Dahlstrom.

40. Regarding **claim 12**, Heilmann substantially teaches a cement kiln chlorine/sulfur bypass system for use with a cement kiln which produces a kiln exhaust including exhaust gas and exhaust particles (column 2, lines 55-65), each particle defining a particle size, the system comprising:

Art Unit: 1797

41. an air bleed means (figure 1, part 14) for bleeding a kiln exhaust gas passage, which runs from an end of a cement kiln to a bottom cyclone (figure 1, part 24; column 3, lines 45-55), the air bleed means receiving the kiln exhaust from the cement kiln (column 2, lines 45-55);

42. a separating means configured to receive the kiln exhaust (figure 1, part 24; column 3, lines 1-5) and to define a passage size (column 3, lines 1-5) exhaust particles defining particle sizes less than the passage size being fine particles and exhaust particles defining particle sizes greater than the passage size being course particles (column 3, lines 1-5).

43. Note that Heilmann does not explicitly teach a circulating liquid tank having fluid stored therein, the fluid defining a fluid pH. However, Heilmann does teach that the fine dust particles are removed from the system (column 3, lines 1-7).

44. In an analogous art of cement kiln dust refinement, McCord teaches treating cement kiln exhaust dust in a circulating liquid tank (column 1, lines 55-68 and column 2, lines 1-10). The liquid has a pH since it is an aqueous solution. it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the process of Heilmann with the process of McCord for the benefit of reducing waste by recycling the fine particles back to the cement kiln.

45. Note also that Heilmann does not explicitly teach an adjustable separating means in fluid communication with the circulating liquid tank that defines passage size. However, Heilmann in view of McCord does teach a cyclone in fluid communication with the circulating liquid tank (Heilmann, figure 1, part 24).

Art Unit: 1797

46. In an analogous art of cyclones, Dahlstrom substantially teaches an adjustable separating means that defines passage size, exhaust particles defining particle sizes less than the passage size being fine particle and exhaust particles defining particle sizes greater than the passage size being coarse particles (column 1, lines 50-55). It would have been obvious to one of ordinary skill in the art at the time of the invention to substitute the cyclone of Dahlstrom with the cyclone of Heilmann for the benefit of improving separating efficiency (column 4, lines 19-21).

47. Note that Dahlstrom does not explicitly teach the passage size is adjustable to control the fluid pH, wherein the fluid pH decreases as the passage size decreases and the fluid pH increases as the passage size increases. However, Dahlstrom's hydrocyclone is used for separating particles based on size (column 1, lines 50-60). As the size (and thereby amount) of dust particles allowed to pass through decreases, the pH would decrease since the dust particles contain alkali material (Heilmann, column 1, lines 30-35). Conversely, the fluid pH would increase as the amount of dust particles allowed to pass through increased.

48. Note also that Heilmann does not explicitly teach a wet dust collector in fluid communication with the adjustable separating means the circulating tank. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to add another hydrocyclone (as described in Dahlstrom) with the apparatus described for the benefit of further improving efficiency. This hydrocyclone could be positioned before the first hydrocyclone so that it would receive exhaust gas and dust particles from the

Art Unit: 1797

kiln, and used to separate fine particles from the gas (Dahlstrom, column 1, lines 50-55).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS BENNETT MCKENZIE whose telephone number is (571) 270-5327. The examiner can normally be reached on Monday-Thursday 7:30AM-5:00PM Alt. Friday 7:30AM-4:00PM EST..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DUANE SMITH can be reached on (571) 272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Duane Smith/
Supervisory Patent Examiner, Art
Unit 1797

TBM

Application/Control Number: 10/537,528
Art Unit: 1797

Page 16